THE JOURNAL

OF

BIOLOGICAL CHEMISTRY

FOUNDED BY CHRISTIAN A. HERTER AND SUSTAINED IN PART BY THE CHRISTIAN A. HERTER MEMORIAL FUND

EDITED FOR THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS

EDITORIAL BOARD

RUDOLPH J. ANDERSON
W. MANSFIELD CLARK
HANS T. CLARKE
CARL F. CORI
EDWARD A. DOISY
A. BAIRD HASTINGS
HOWARD B. LEWIS
ELMER V. McCOLLUM
WILLIAM C. ROSE
WILLIAM C. STADIE
DONALD D. VAN SLYKE
HUBERT B. VICKERY

VOLUME 147
BALTIMORE
1943

COPYRIGHT, 1943
BY
THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC.

PUBLISHED AT YALE UNIVERSITY FOR
THE AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC.
WAVERLY PRESS, INC.
BALTIMORE, U. S. A.

Medical
Wahr

CONTENTS OF VOLUME 147

No. 1, January, 1943

PAGE

Morton, M. E., and Chaikoff, I. L. The formation *in vitro* of thyroxine and diiodotyrosine by thyroid tissue with radioactive iodine as indicator 1

Greenberg, Leon A. Acetoin: polarographic determination and disappearance from the blood after administration 11

Bernhart, F. W., and Skeggs, Leonard. The iron content of crystalline human hemoglobin 19

Cullen, S. C., and Cook, E. V. Solubility of nitrous oxide in human blood 23

Tenenbaum, Leon E., and Jensen, H. Catecholase (tyrosinase): reversible inactivation and reactivation 27

Bueding, Ernest, and Goldfarb, Walter. Blood changes following glucose, lactate, and pyruvate injections in man 33

DuBois, K. P., and Potter, V. R. The preparation of hexose diphosphate, hexose monophosphate, and phosphoglyceric acid 41

Roberts, E. C., Cain, C. K., Muir, R. D., Reithel, F. J., Gaby, W. L., Van Bruggen, J. T., Homan, D. M., Katzman, Philip A., Jones, L. R., and Doisy, Edward A. Penicillin B, an antibacterial substance from *Penicillium notatum* 47

Fuhr, Irvin, and Steenbock, H. The effect of dietary calcium, phosphorus, and vitamin D on the utilization of iron. I. The effect of phytic acid on the availability of iron 59

Fuhr, Irvin, and Steenbock, H. The effect of dietary calcium, phosphorus, and vitamin D on the utilization of iron. II. The effect of vitamin D on body iron and hemoglobin production 65

Fuhr, Irvin, and Steenbock, H. The effect of dietary calcium, phosphorus, and vitamin D on the utilization of iron. III. The relation of rickets to anemia 71

Marx, Walter, Simpson, Miriam E., and Evans, Herbert M. Purification of the growth hormone of the anterior pituitary 77

Granick, S., and Michaelis, Leonor. Ferritin. II. Apoferritin of horse spleen 91

Fraenkel-Conrat, Heinz, Simpson, Miriam E., and Evans, Herbert M. Influence of adrenalectomy and of adrenocortical steroids on liver arginase 99

Shahrokh, Bahman K. A new method for the microdetermination of iodine in certain biological materials 109

Reineke, E. P., Williamson, M. B., and Turner, C. W. The effect of progressive iodination followed by incubation at high temperature on the thyroidal activity of iodinated proteins 115

Miller, Herbert C. The extrarenal regulation of muscle and serum potassium following extracellular fluid and sodium depletion 121

Gallagher, T. F., and Long, William P. Partial oxidation of cholic acid 131

Plentl, Albert A., and Page, Irvine H. The enzymatic nature of angiotonin formation from renin and renin activator 135

Plentl, Albert A., Page, Irvine H., and Davis, W. W. The nature of renin activator 143

Bollman, Jesse L., and Flock, Eunice V. Phosphocreatine and inorganic phosphate in working and resting muscles of rats, studied with radioactive phosphorus 155

MUÑOZ, JUAN M., and LELOIR, LUIS F. Fatty acid oxidation by liver enzymes... 355
MARENZI, A. D., and CARDINI, C. E. The colorimetric determination of choline. 363
MARENZI, A. D., and CARDINI, C. E. On the determination of the phospholipids in blood ... 371
PEARLMAN, W. H., and PINCUS, GREGORY. The metabolism of estrone in men... 379
GORDON, SOLON A., and WILDMAN, SAM G. The conversion of tryptophane to a plant growth substance by conditions of mild alkalinity ... 389
ROE, JOSEPH H., and KUETHER, CARL A. The determination of ascorbic acid in whole blood and urine through the 2,4-dinitrophenylhydrazine derivative of dehydroascorbic acid ... 399
SHELINE, G. E., CHAIKOFF, I. L., JONES, H. B., and MONTGOMERY, M. LAURENCE. Studies on the metabolism of zinc with the aid of its radioactive isotope. I. The excretion of administered zinc in urine and feces ... 409
FRIEDEMANN, THEODORE E., and HAUGEN, GLADYS E. Pyruvic acid. II. The determination of keto acids in blood and urine ... 415
HELLERMAN, LESLIE, CHINARD, FRANCIS P., and DEITZ, VICTOR R. Protein sulfhydryl groups and the reversible inactivation of the enzyme urease. The reducing groups of egg albumin and urease ... 443
LINK, KARL PAUL, OVERMAN, RALPH S., SULLIVAN, WILLIAM R., HUEBNER, CHARLES FERDINAND, and SCHEEL, LESTER D. Studies on the hemorrhagic sweet clover disease. XI. Hypoprothrombinemia in the rat induced by salicylic acid ... 463
WILSON, P. W., BURRIS, R. H., and COFFEE, W. B. Hydrogenase and symbiotic nitrogen fixation ... 475

Letters to the Editors

STOKES, JACOB L., and MARTIN, BEVERLY B. Influence of buffer and glucose in the *Lactobacillus casei* assay for pantothenic acid ... 483
MITCHELL, HERSCHEL K., ISBELL, EDITH R., and THOMPSON, ROY C. Microbiological assays for *p*-aminobenzoic acid ... 485

No. 3, MARCH, 1943

ALLES, GORDON A., and HEEGAARD, ERIK V. Substrate specificity of amine oxidase ... 487
HEEGAARD, ERIK V., and ALLES, GORDON A. Inhibitor specificity of amine oxidase ... 505
GYÖRGY, PAUL, and TOMARELLI, RUDOLPH. Antioxidant activity in sources of the B vitamins ... 515
FLEISCHER, GERHARD A. On the alcohol solubility of prolactin ... 525
SCHWENK, ERWIN, FLEISCHER, GERHARD A., and TOLKSDORF, SIBYLLE. A new method for the preparation of prolactin ... 535
HERBST, ROBERT M., and SHEMIN, DAVID. The synthesis of peptides by transamination ... 541
RATNER, S., WEISSMAN, NORMAN, and SCHOENHEIMER, RUDOLF. The metabolism of *d*-lysine investigated with deuterium and heavy nitrogen ... 549
SOFIN, LOUIS H., ROSENBLUM, HAROLD, and SHULTZ, ROBERT C. A color reaction for methionine ... 557
KUIZENGA, MARVIN H., WICK, ARNE N., INGLE, DWIGHT J., NELSON, JOHN W., and CARTLAND, GEORGE F. The preparation and comparative physiological activities of beef, hog, and sheep adrenal cortex extracts ... 561

FREE, ALFRED H., DAVIES, DEAN F., and MYERS, VICTOR C. Effect of sulfanilamide accompanied by acid or alkali upon the acid-base equilibrium of the dog. Possible influence of carbonic anhydrase 167
ROBINSON, C. S., LUCKEY, HUGH, and MILLS, HUGH. Factors affecting the hydrogen ion concentration of the contents of the small intestine 175
POLLACK, MAXWELL A., and LINDNER, MANFRED. A growth stimulant for *Lactobacillus casei* 183
MORGAN, AGNES FAY, and SHIMOTORI, NOBUKO. The absorption and retention by dogs of single massive doses of various forms of vitamin D 189
SHIMOTORI, NOBUKO, and MORGAN, AGNES FAY. Mechanism of vitamin D action in dogs shown by radioactive phosphorus 201
HOBERMAN, HENRY D., and RITTENBERG, D. Biological catalysis of the exchange reaction between water and hydrogen 211
LITTLE, JOHN E., and CALDWELL, M. L. A study of the action of pancreatic amylase. II 229
EWING, D. T., TOMKINS, F. S., and KAMM, OLIVER. The ultraviolet absorption of vitamin K_1 and the effect of light on the vitamin 233
KRAMPITZ, L. O., WOOD, H. G., and WERKMAN, C. H. Enzymatic fixation of carbon dioxide in oxalacetate 243

Letters to the Editors

ALLISON, JAMES B., COLE, WILLIAM H., LEATHEM, JAMES H., NASTUK, WILLIAM L., and ANDERSON, JOHN A. Acidosis and decreased urine flow in the rabbit during gravity shock 255
TOTTER, JOHN R., and DAY, PAUL L. Xanthopterin in the treatment of leucopenia and weight loss in rats fed succinylsulfathiazole 257
HOFFMAN, M. M., KAZMIN, V. E., and BROWNE, J. S. L. The excretion of pregnanediol following the administration of desoxycorticosterone acetate to rabbits 259
WRIGHT, LEMUEL D. The state of pantothenic acid in blood 261

No. 2, FEBRUARY, 1943

LEPAGE, G. A., and UMBREIT, W. W. Phosphorylated carbohydrate esters in autotrophic bacteria 263
NORRIS, FRANK A., RUSOFF, IRVING I., MILLER, ELMER S., and BURR, GEORGE O. Fractional distillation of unsaturated fatty acids. II. The effect of heat on the rearrangements produced in unsaturated fatty acid esters 273
HUMOLLER, FRED L. A titrimetric method for the estimation of small amounts of glucose 281
VISSCHER, FRANK E., and CORLEY, RALPH C. Influence of linoleic and palmitic acids of the diet on synthesis and storage of fatty acids in the white rat 291
WYMAN, JEFFRIES, JR., and INGALLS, ELIZABETH N. A nomographic representation of certain properties of the proteins 297
STARK, IRENE E., and SOMOGYI, MICHAEL. The quantitative relationship between β-hydroxybutyric acid and acetoacetic acid in blood and urine 319
STETTEN, DEWITT, JR. Metabolism of a paraffin 327
MCBRIDE, J. J. Liver glycogenesis and fasting in the rat. The effect of glucose feeding on the water balance 333
BAKER, DWIGHT L., and NELSON, J. M. Non-oxidase nature of kidney "laccase". 341
BELFER, SAMUEL, KORAN, PEARL, EDER, HOWARD, and BRADLEY, H. C. The autolysis of invertebrate tissues 345

MORTON, M. E., CHAIKOFF, I. L., REINHARDT, W. O., and ANDERSON, EVELYN. Radioactive iodine as an indicator of the metabolism of iodine. VI. The formation of thyroxine and diiodotyrosine by the completely thyroidectomized animal 757

EVANS, E. A., JR., VENNESLAND, BIRGIT, and SLOTIN, LOUIS. The mechanism of carbon dioxide fixation in cell-free extracts of pigeon liver 771

ALLINSON, M. J. CARL. A specific enzymatic method for the determination of nicotinic acid in blood 785

INDEX TO VOLUME 147 793

JACOBS, WALTER A., and CRAIG, LYMAN C. The aconite alkaloids. XI. The action of methyl alcoholic sodium hydroxide on atisine. Isoatisine and dihydroatisine 567
JACOBS, WALTER A., and CRAIG, LYMAN C. The aconite alkaloids. XII. Benzoyl heteratisine, a new alkaloid from *Aconitum heterophyllum* 571
TURNER, D. L., and MILLER, F. R. The preparation of concentrates of specific substances from urine and feces in leucemia 573
WOOLLEY, D. W. Isolation and partial determination of structure of soy bean lipositol, a new inositol-containing phospholipid 581
GORNALL, ALLAN G., and HUNTER, ANDREW. The synthesis of urea in the liver, with special reference to citrulline as an intermediary in the ornithine cycle .. 593
DOHERTY, DAVID G., TIETZMAN, JOSEPHINE E., and BERGMANN, MAX. Peptides of dehydrogenated amino acids 617
SHAW, J. C., and PETERSEN, W. E. The utilization of β-hydroxybutyric acid by the perfused lactating mammary gland 639
FOX, SIDNEY W., MCNEIL, EDNA W., and FIELD, HENRY, JR. A simplified photelometric estimation of trigonelline 645
FOX, SIDNEY W., and FIELD, HENRY, JR. The synthesis of nicotinuric acid 651
BOTT, P. A. Quantitative studies of the composition of glomerular urine. XV. The concentration of sodium in glomerular urine of *Necturi* 653
KNIGHT, C. A. The sulfur distribution in the rib-grass strain of tobacco mosaic virus 663
GRINSTEIN, MOISES, and WATSON, CECIL JAMES. Studies of protoporphyrin. I. The purification of protoporphyrin IX as obtained from hemoglobin 667
GRINSTEIN, MOISES, and WATSON, CECIL JAMES. Studies of protoporphyrin. II. A note on an improved micromethod for converting protoporphyrin to mesoporphyrin 671
GRINSTEIN, MOISES, and WATSON, CECIL JAMES. Studies of protoporphyrin. III. Photoelectric and fluorophotometric methods for the quantitative determination of the protoporphyrin in blood 675
DOUNCE, ALEXANDER L. Enzyme studies on isolated cell nuclei of rat liver ... 685
DUBOIS, K. P., ALBAUM, H. G., and POTTER, V. R. Adenosine triphosphate in magnesium anesthesia 699
COHN, GUNTHER, and KOLTHOFF, I. M. Determination of calcium by precipitation with picrolonic acid and polarographic measurement of the residual picrolonic acid 705
STARK, IRENE E., and SOMOGYI, MICHAEL. The effect of glucose feeding upon the quantitative relationship between β-hydroxybutyric acid and acetoacetic acid in blood and urine 721
STARK, IRENE E., and SOMOGYI, MICHAEL. The effect of insulin upon the quantitative relationship between β-hydroxybutyric acid and acetoacetic acid in blood and urine 731
JENSEN, H., and TENENBAUM, LEON E. Further purification of catecholase (tyrosinase) 737
LIGHT, AMOS E., and CLARKE, MIRIAM F. Studies relating to the use of *Lactobacillus casei* in microbiological assays 739
GREENBERG, DAVID M., COPP, D. HAROLD, and CUTHBERTSON, ELIZABETH M. Studies in mineral metabolism with the aid of artificial radioactive isotopes. VII. The distribution and excretion, particularly by way of the bile, of iron, cobalt, and manganese 749